

A NEW GENUS AND TWO NEW SPECIES OF NORTHERN NEW ZEALAND LANDSNAILS (MOLLUSCA: PUNCTIDAE)

F.M. CLIMO AND J.F. GOULSTONE

Abstract. *Kokikora* n. gen. is established containing two new species. *Kokikora angulata* n. sp. is widely distributed mainly in the North Auckland Peninsula, and *Kokikora mimiwhangata* n. sp. has been found at only a few sites on the east coast of Northland. Both snails seem to prefer a coastal habitat.

During a survey of recent, and sub-fossil deposits on dunes at Mimiwhangata in Northland, New Zealand, Dr Fred Brook and J.F.G. discovered a small undescribed punctid with an apparently limited distribution and habitat preference. The snail was also found in a similar situation at Deep Water Cove and Whangaruru to the north. Also found in the area, both alive and in the sub-fossil deposits, was a similar but much larger species, widely distributed in the north, with sporadic occurrences further south. Though long known to local malacologists it has never been formally described. While clearly recognised as members of the family Punctidae neither of these species seems assignable to any known generic group so we have erected a new genus to accommodate them.

The taxon descriptions and distributions given in this paper are based on specimens held in the Auckland Museum (AK), the Museum of New Zealand (MNZ) and in one case the Auckland University Geology Department (AUG). For type material, the number of specimens is given in parentheses following the accession number. The following names of collectors which occur frequently in the distribution records are referred to by initials only: F. Brook, F.M. Climo, J.F. Goulstone, B.F. Hazelwood, P. Mayhill, R. Parrish, D.J. Roscoe. Map references are from the N.Z.M.S. 260 series and all dates refer to the 20th century.

SYSTEMATICS

FAMILY: PUNCTIDAE Morse, 1864

GENUS: *KOKIKORA* n. gen.

ETYMOLOGY: Derived from Maori, *koki* = bent; *kora* = fragment.

TYPE SPECIES: *Kokikora angulata* n. sp.

GENERIC DESCRIPTION

Shells small (less than 3 mm), unicoloured, turbate or depressed turbate, with distinctly (though not sharply) angled bodywhorls. Protoconch mostly smooth or with faint spiral sculpture. Post-nuclear whorls either smooth or having some growth ridges. Umbilicus



Figs 1-2. *Kokikora angulata* n. sp. 1. Geographic distribution, abridged. 2. Waikowhai, 1.8 mm x 1.3 mm (holotype AK72415).

relatively wide up to a quarter of width of shell. Animal with light black markings and some yellow pigment on the visceral coil. Male genitalia with narrow external epiphalus about the same length as the penis which it enters sub-apically just below the penis retractor muscle. Terminal female genitalia with short vagina and narrow free oviduct. The entrance to the spermathecal duct as wide or wider than the oviduct and extending into a considerable pocket before reducing to a fine tube. (Based on both species in the genus).

***Kokikora angulata* n. sp. Figs 1-6**

Synonymy: '*Paralaoma*' n. sp. 38 Solem, Climo & Roscoe 1981:479. Ballance 1982:31. Punctid n.sp. 38 Goulstone, Mayhill & Parrish 1993:19. Goulstone 1983:45. Goulstone 1990:41. N. gen.1, n. sp.1 Climo 1993:27,35.

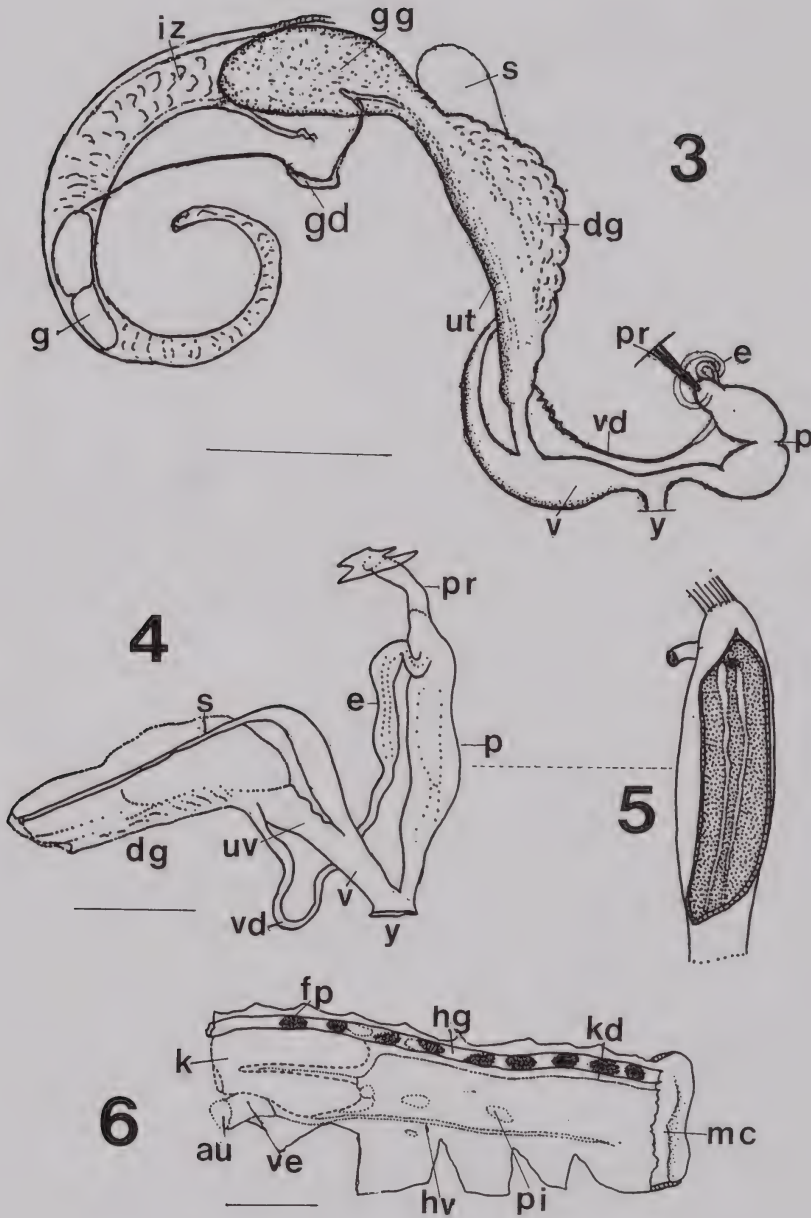
DESCRIPTION

Shell small (maximum diameter recorded 2.4 mm, but most adults nearer 1.8 mm), depressed turbinate, mainly transparent and faintly brown coloured when adult. Juveniles often white. No sculpture other than irregular growth lines and very faint microscopic spirals extending at same strength over whole shell. With the animal inside, mantle pigmentation as viewed through base of shell often gives effect of fine radial sculpture. Whorls, about four and a half on an adult shell, regularly expanding, slightly accelerating on the final whorl. Sutures slightly impressed and body whorl with a definite angle, though not sharp. Umbilicus moderately wide, between one quarter and one fifth of maximum diameter. Protoconch, of one and a quarter whorls flat and moderately large (one third to one quarter of maximum shell width).

Animal with black scratchy markings over the mantle roof and further patches on the albumen and digestive glands. Lines and blobs of yellow white pigment occur over most of the visceral coil. Male genitalia consist of a narrow epiphalus about the same length as the extended penis, which it enters just beneath the penis retractor muscle. With the animal retracted in the shell the penis has a sharp bend in the middle and the epiphalus has several coils. Female genitalia consist of a short vagina and narrow, short oviduct. The start of the spermathecal duct is wider than the oviduct and it maintains this width for twice the length of the oviduct before reducing to a very fine tube. The pear shaped spermathecal sac rests at the base of the albumen gland. The prostate gland is prominent, consisting of a clear jelly-like mass adjoining the uterus. The ovotestis, imbedded about half way along the digestive gland, consists of two oblong clumps almost joined together comprising finger like fused sections. These are connected to the talon, buried in the base of the albumen gland, by an extremely fine tube with a short swollen section near the gland. The kidney is bilobed with equal lobes. (Based on five dissections.)

REMARKS

This species possesses a plain shell which is, however, easily recognised by its angled body whorl and moderately wide umbilicus. *K. mimiwhangata* n. sp. (see below) is similar but the two species should be easily separated on size. Shells of *K. angulata* were prominent in the sub-fossil deposit at Mimiwhangata, where some specimens were 2.4 mm in greater shell diameter. Some shells found over an old midden alongside the Mangere Oxidation Ponds



Figs 3-6. *Kokikora angulata* n. sp. 3. Reproductive tract (Helena Bay specimen). 4-6. Nelson specimen. 4. Distal genitalia. 5. Detail of penis lumen. 6. Mantle. Abbreviations: au - auricle, dg - prostate, e - epiphallus, fp - faecal pellet, g - ovotestis, gd - hermaphroditic duct, gg - albumen gland, hg - hindgut, hv - principal pulmonary vein, iz - stomach, k - kidney, kd - ureter, mc - mantle collar, p - penis, pi - pigment spot, pr - penial retractor muscle, s - spermatacal shaft and its sac, ut - uterus, uv - post uterine oviduct, v - vagina, vd - vas deferens, ve - ventricle, y - genital atrium.

Scale lines = 0.5 mm.

(R11 659675, J.F.G.) were of a similar size. Mature individuals in extant populations are predominantly 1.8 mm in shell diameter.

The disjunct western distribution of *K. angulata* (Fig. 1) has a parallel with several plant species (Heads 1993): *Hebe gracillama* (Kirk, 1896), *H. townsonii* (Cheeseman, 1913), *H. speciosa* (A. Cunn., 1836).

TYPE LOCALITY: Waikowhai Reserve, Manukau Harbour, North Island, New Zealand, along coastal cliffs, R11 724646.

HOLOTYPE: Auckland Museum, AK72415. 1.8 mm x 1.3 mm, J.F.G. 19/10/91.

PARATYPES: All from type locality. AK72415 (6), J.F.G., 19/10/91. MNZ116462 (10), J.F.G. 19/10/91.

HABITAT

Coastal. It sometimes occurs away from the coast but in small numbers. In other elements of the New Zealand land snail fauna this coastal preference can be taken as calciphile but *K. angulata* has not been particularly associated with limestone in the available collections. At Mimiwhangata most of its coastal habitats have been destroyed and it is present only in the epiphytes of remnant trees, particularly pohutukawa (*Metrosideros excelsa*). The snail is not found on nikau (*Rhopalostylis sapida*). At Waikowhai, the type locality, *K. angulata* occurs along coastal cliffs on the ground under pohutukawa, karaka (*Corynocarpus laevigatus*), and kawakawa (*Macropiper excelsum*) but could not be found on the low foliage or on the trunks. Here the foliage was covered with *Tornatellides subperforata* (Suter)(Achatinellidae), while *Phrixgnathus moellendorffi* (Suter)(Punctidae) inhabited the pohutukawa trunks as far up as we could reach, so perhaps these particular niches have been filled. There were no epiphytes on the Waikowhai pohutukawas. It was interesting to find *K. angulata* in the Auckland Domain, obviously a leftover from a population in the original bush which, before extensive land reclamation, would have been on the shoreline.

DISTRIBUTION (Fig. 1)

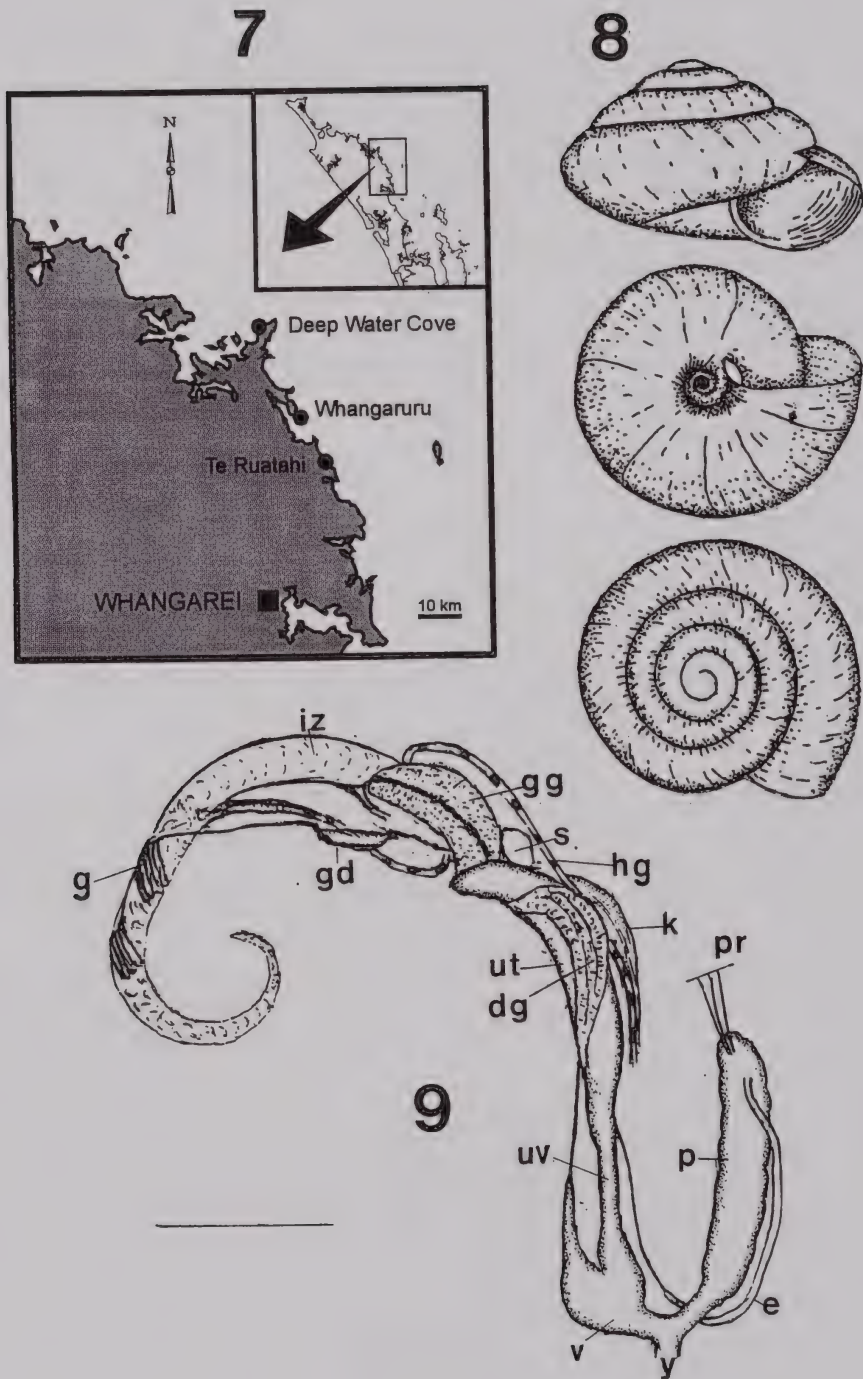
N.W. Nelson: Puponga Point, F.M.C. 3/1/67, MNZ 61562; Puponga Point manuka debris, F.M.C. 17/3/71, MNZ 38192; Takaka, Tata Island, B.F.H. 6/6/77, MNZ 87712. **North Taranaki:** Tongaporutu River mouth, coastal nikau, F.M.C. 8/3/77, MNZ56593. **Manukau Peninsula:** Waipipi Scenic Reserve, Waiuku, F.M.C. & D.J.R. 11-12/2/81, MNZ78546; head of Track Gully, F.M.C. 15/2/81, MNZ77832. **Waitakere Ranges:** Titirangi, A.E. Brookes, undated, AK 82821; Te Henga, P.M. -/1/80, MNZ99259; Houghtons Bush, Q11 387862, Q11 386869, J.F.G. -/11/82, AK 82829, P.M. -/5/78, MNZ99245; Muriwai, Korekore Pa Hill, A.W.B. Powell 1925, AK 82822; Muriwai, Maori Pa Hill, collector and date unknown, AK 82830; Muriwai, J.F.G. 1981, MNZ70135. **Auckland:** Motutapu Is. midden, R. Nichols 1982-3, MNZ 80033; Motutapu under Rangitoto ash, B. McFadgen 13/2/74, MNZ47340; Rangitoto Is. Site 3, B.F.H. 20/11/77, MNZ 68599; Waikowhai, N. Gardner 20/3/80, MNZ 68022. Mangere Oxidation Ponds, sub-fossil, R11 659675, J.F.G. 28/2/92, AK 82831. St. Heliers, Dingle Dell R11 759810, J.F.G. 14/9/86, AK 82832. Auckland Domain, R11 688812, J.F.G. 27/12/86, AK 82833. Hobsonville R.N.Z.A.F. base, P. Sudlow -/12/80, MNZ70756.

Coromandel Peninsula, Port Jackson, fossil, S09 226211, J.F.G. -/1/78, MNZ57802, MNZ 57846. **Little Barrier Island**, under kanuka, J.S. Edwards, -/1/53, AK 82826. **Mahurangi**, Ngarewa Drive, R10 652192, B.F.H. 31/1/87, MNZ97680. **Warkworth**, Sandspit, R09 623320, D.J.R. 25/12/78, MNZ104369. Whangateau Beach, B.F.H. 31/1/87, MNZ99466. Poutu Peninsula, Tapu Bush, P09072421, R.P. 11/2/88, MNZ96675, P.M. -/10/86, MNZ97744. **Whangarei**: Coronation Reserve, P.M. -/2/80, MNZ68765; Skull Creek, limestone, Q07 348972, R.P. -/7/88, MNZ99454. Mimiwhangata, sub-fossil deposit, Q06 407371, F.B. 1993, AK 82824, P.R. Millener 22/2/78, Auckland University Geology Dept. Q06 404370, F.B. & J.F.G. 7/12/93, AK 82827. Helena Bay, Q06 356395, F.B. 15/5/94. **Maunganui Bluff**: D.J.R. 6/10/76, MNZ61950, B.F.H., MNZ52487; Moir Rd., P.M. -/2/80, MNZ63301. Opononi, N.E. of, Motutoa midden, O06 492349, C. Fredericksen 1989, MNZ97504. **Waima Forest**: Mountain Rd. O06 515345, J.F.G. -/5/90, AK 82838; Waitotemarama, P.M. -/11/86, MNZ98254. Warrawarra Sth. Maungataniwha, O05 371436, P.M. -/1/90, MNZ101636. **Cavalli Islands**, astelia clumps on pohutukawas, P04 971890, R.P. 27/8/88, MNZ99418. Whangaroa Motor Camp, head of small valley, P04 792814, D.J.R. 27/12/78, MNZ104360. Te Puna Bush, P05 063669, P.M. -/1/90, MNZ101576. Rawhiti roadside, Q05 251618, P.M. /8/87, MNZ98812. Ahipira-Hunahuna Catchment, P.M. -/11/87, MNZ98789. **Herekino**: North, Larmers Rd. P.M. -/10/78, MNZ62491; Gorge, N05 283657, J.F.G. -/1/69, AK 82834, between Ahipara & Manukau, B.F.H. 4/1/76, MNZ48684. Mangonui, Oruru Valley, manuka scrub, R. Wallace 1986, MNZ87652. **Doubtless Bay**, Tokerau dunes, A. Richardson, AK 82837. **Mangamuka Gorge**: Bridge, B.F.H. 1/1/76, MNZ 48663, P.M. -/10/78. **Hohoura**: Mt. Camel, B.F.H. 4/1/76, MNZ61561, MNZ70085, N03 258088, R.P. & K. Walker 26/3/88, MNZ96554, W. base, P.R. Jamieson 12/1/75, MNZ88455. Puruhi Island, Motu, N03 252162, R.P. 4/8/88, MNZ99433. **Te Paki**: Spirits Bay, N02 922497 J.F.G. 11/5/91, AK 82835; Waterfall Ck., B.F.H. 3/1/76, MNZ70044, MNZ47953; Tapotupotu Res., A.W.B. Powell, 9/3/67, AK 82828; Whareana *Placostylus* colony, P.M. -/5/82, MNZ79014; Aupouria Archaeological Study N3&4/168-b-1 "A", R. Wallace 1980, MNZ74054, "B", MNZ 74015; Spirits Bay - Te Hapua junction, N02 966449, P. Anderson *et al.* 4/3/85, MNZ81788; Ngaiwituararoa Pa, N02 977450, P. Anderson *et al.* 4/3/85, MNZ77125; Aupouria State Forest, J. Coster 1981, MNZ70432; North Cape, N02 966449, G. Carlin -/7/84, MNZ79649, Maori land N1/46-44, loc. 1 & 2, B.F.H. -/10/76, MNZ54249; Northern Block, N02 093474, R.P. 16/3/88, MNZ96622, N02 087464, C. Ogle 5/3/85, MNZ76981; Waitanoni Stream, Kapowairua catchment, N02 001525, C. Ogle *et al.* -/11/86; Ponaki Stream, site G(7) 20 m, N02 086463, C. Ogle *et al.* -/11/86, MNZ87832; Unuwaho Pa site, N02 009518, C. Ogle *et al.* -/11/86, MNZ87919.

***Kokikora mimiwhangata n. sp.* Figs 7-9**

DESCRIPTION

Shell partly transparent, small (1.4 mm), turbate. Adults with four and a quarter whorls. Colour greenish brown hardly changing from juvenile through to adult. Sutures moderately impressed and simple. In mature specimens the body whorl can drop producing a stepped effect between the last two whorls. Final whorl very lightly angled, hardly apparent in adult, more noticeable in juvenile. Protoconch relatively large, flattish and smooth, about one and a quarter whorls (one third to one quarter of maximum shell diameter). Post-nuclear sculpture consisting of only faint growth ridges. Umbilicus moderately open, about one quarter to one fifth the shell diameter.



Figs 7-9. *Kokikora mimiwhangata* n. sp. 7. Geographic distribution. 8. Mimiwhangata, Te Ruatahi, 1.4 mm x 0.9 mm (holotype AK72413). 9. Details of anatomy. Abbreviations as for Figs 3-6. Scale line = 0.5 mm.

Animal with little coloration in the mantle linings except for an occasional blob of yellow pigment. One specimen had a strong black line across the albumen gland. Male genitalia comprising comparatively long straight penis (1 mm) and equally long, narrow external epiphallus. When animal withdraws in shell the penis lies beside the narrow oviduct and uterus, behind the vagina. The vagina is short but wide, wider entering the spermathecal duct than the oviduct. The prostate is a delicate flat latticework organ curling around the top section of the uterus. The hindgut leaves the digestive gland about halfway along on the inside and loops round the back of the albumen gland before passing the kidney and exiting through the mantle collar. The kidney is bilobed, pointed where the ureter exits it. The ovotestis consists of two clumps of separate finger-like organs imbedded sub apically in the digestive gland. These are connected by a very fine tube with a considerable swelling where it nears the albumen gland then a reduction to a fine tube again to enter the talon in the base of the gland. (Based on two dissections.)

REMARKS

This species has a restricted known range and is like a miniature form of *K. angulata*. Though it occurs in reasonable numbers at Mimiwhangata, Deep Water Cove and Whangaruru it was not seen in the sub-fossil deposits. *K. mimiwhangata* can easily be separated from *K. angulata* on size alone, as a specimen of the latter of 1.4 mm has only 2-3 whorls as opposed to the former's four. *K. mimiwhangata* has regularly increasing whorls whereas the final whorl of *K. angulata* is somewhat expanded. *K. mimiwhangata*, though it has no ribbing, could also be confused with *Paralaoma lateumbilicata* (Suter), for it is similar in size and general appearance.

TYPELOCALITY: Mimiwhangata, behind Te Ruatahi Beach, Northland, North Island, New Zealand, Q06 399373.

HOLOTYPE: Auckland Museum, AK 72413, 1.4 mm x 0.9 mm, F.B. & J.F.G. 7/12/93.

PARATYPES: AK72414 (12), Q06 402375, F.B. & J.F.G. 28/12/93. MNZ116461 (6), Q06 399373, F.B. & J.F.G. 7/12/93.

HABITAT

We found this snail alive in fallen nikau fronds in remnant bush behind Te Ruatahi, Mimiwhangata, and similarly behind a small bay at Whangaruru and at Deep Water Cove. At Whangaruru one live specimen was found in a very low epiphyte but although we sampled many epiphytes in a range of trees it was never found elsewhere. Dead specimens were found in several lots of litter under taraire (*Beilschmiedia tarairi*) at Mimiwhangata but there were plenty of nikau nearby.

DISTRIBUTION (Fig. 7)

Deep Water Cove, Waitui Stream, Q05 299664, F.B. & J.F.G. 8/12/93, AK82839, MNZ116463; Whangaruru, north headland, Q05 343465, F.B. 24/6/94, AK83610.

DISCUSSION

The coast between Cape Brett and Tauranga Kawau Point, at the southern end of the Mimiwhangata Coastal Park, has a snail fauna distinct from that of the rest of Northland. While *K. mimiwhangata* populations may have been overlooked, due to the small size and drabness of the shells, current evidence suggests the species is endemic and restricted to this faunal zone.

The coastal forest at Mimiwhangata, the type locality of *K. mimiwhangata*, has been largely destroyed for pastoral farming but the recent acquisition by the Department of Conservation of a large area for development as a Coastal Farm Park has meant that remaining areas of bush are being fenced and protected from stock. In particular the management of the fenced area of bush in the valley behind the Te Ruatahi Beach at the south end of the park will be critical for the survival of *K. mimiwhangata* in this location. An area of bush in a gully immediately to the north of this fenced area, opposite Komakoraia Island, though it was much damaged by stock and is probably thought to be not worth saving, nevertheless still retains a population of *K. mimiwhangata*. This population will be lost if present conditions are allowed to continue. However, 20 km north the reserve at Whangaruru North Head, containing as it does an important *Placostylus* colony, is quite secure, well managed and should ensure the survival of *K. mimiwhangata* at this site, though our sampling found it rather scarce. Further north at Deep Water Cove it was found in a small remnant of original bush surrounded by much that was regenerating. Though this was a reserve which should have a high conservation status, it appeared neglected and goats were a problem. *K. angulata* on the other hand is widespread, fairly hardy, lives in a variety of habitats, and on present evidence is not in danger.

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F.M. CLIMO, Museum of New Zealand, P.O. Box 467, Wellington. J.F. GOULSTONE, 89 Hall Avenue, Mangere, Auckland.

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